CLAIMS

1.   A classifier for determining whether an instance belongs to a particular class of instances of a plurality of classes, the classifier comprising:

        a plurality of first classifiers that operate on an instance to provide an indication as to which class the instance belongs, each of which classifiers is trained on a different subset of training instances from a same set of training instances wherein each training subset comprises a group of training instances that share at least one characteristic trait and different subsets have a different at least one characteristic trait; and

        a second classifier that operates on the indications provided by the first classifiers to provide an indication as to which class the instance belongs.

2.   A classifier according to claim 1 wherein each first classifier operates on a portion of an instance and a plurality of first classifiers operates on at least one portion of the instance.

3.   A classifier according to claim 1 or claim 2 wherein a training subset of instances comprises a relatively small number of the total number of instances comprised in the set of training instances.

4.   A classifier according to claim 3 wherein the number of instances is less than or equal to 10% of the total number of instances.

5.   A classifier according to claim 3 wherein the number of instances is less than or equal to 5% of the total number of instances.

6.   A classifier according to claim 3 wherein the number of instances is less than or equal to 3% of the total number of instances.

7.   A classifier according to any of the preceding claims wherein the instances are images and the classifier determines whether an image comprises an image of a particular feature to determine to which class the image belongs.

8.   A classifier according to claim 7 wherein the feature is a person.

9.   An automotive collision warning and avoidance system comprising a classifier in accordance with any of the preceding claims.

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10.   A method of using a set of training instances to train a classifier comprising a plurality of first classifiers that operate on an instance to indicate a class of instances to which the instance belongs and a second classifier that uses indications provided by the first classifiers to determine a class to which the instance belongs, the method comprising:

10   grouping training instances from the set of training instances into a plurality of subsets of training instances wherein each training subset comprises a group of training instances that share at least one characteristic trait and different subsets have a different same at least one characteristic trait;

            training each of the first classifiers on a different one of the training subsets; and

15   training the second classifier on substantially all the training instances.

11.   A method according to claim 10 and comprising partitioning each instance into a plurality of portions and training a first classifier for each portion and a plurality of first classifiers for at least one portion.

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12.   A method according to claim 10 or claim 11 wherein a training subset of instances comprises a relatively small number of the total number of instances comprised in the set of training instances.

25 13.   A method according to claim 12 wherein the number of instances is less than or equal to 10% of the total number of instances.

14.   A method according to claim 12 wherein the number of instances is less than or equal to 5% of the total number of instances.

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15.   A method according to claim 12 wherein the number of instances is less than or equal to 3% of the total number of instances.

16.   A method according to any of claims 10-15 wherein the instances are images and the classifier is trained to determine whether an image comprises an image of a particular feature to determine to which class the image belongs.

17.   A method according to claim 16 wherein the feature is a person.

18.   A classifier for determining a class to which an instance is represented by a descriptor vector in a space of vectors belongs comprising:

a plurality of sets of training vectors wherein vectors that belong to a same set represent training instances in a same class of instances and training vectors belonging to different sets represent training instances belonging to different classes of instances; and

an operator that determines for each set of vectors projections of the descriptor vector on all the training vectors in the set and determines to which class the instance belongs responsive to the projections on the sets.

19.   A classifier according to claim 18 wherein the operator determines for each set of vectors a sum of the squares of the projections and that the instance belongs to the class of instances corresponding to the set of vectors for which the sum is largest.

20.   A method of classifying an instance represented by a descriptor vector comprising:

providing a plurality of sets of training descriptor vectors wherein vectors that belong to a same set represent training instances in a same class of instances and training vectors belonging to different sets represent training instances belonging to different classes of instances;

determining for each set of training vectors projections of the descriptor vector on all the training vectors in the set; and

determining to which class the instance belongs responsive to the projections.

21.   A method according to claim 20 and comprising determining a sum of the squares of the projections for each set and that the instance belong to the class of instances corresponding to the set of training vectors for which the sum is largest.